

Applicant : Daniel M. Lafontaine
Serial No. : 10/659,116
Filed : September 10, 2003
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Attorney's Docket No.: 10527-429004 / SM-P0290US04

REMARKS

This paper responds to the non-final Office Action mailed January 18, 2005. The applicant thanks the Examiner for the careful consideration of the claims in that Office Action. Claims 28, 30-32, and 36-41 are currently pending and have been rejected in the Office Action. Several of the claims have been amended, for example to recite cooling with a phase change in a fluid. Support for such amendments can be found, for example, at page 19, line 19 through page 20, line 11. In light of the amendments and arguments made here, applicant believes that all pending claims are in condition for allowance and seeks the same.

Double Patenting Rejection

Claims 28 and 30 stand rejected on grounds of obviousness-type double patenting over claims 1 and 4 of U.S. Patent No. 6,648,878, and claims 38 and 41 stand rejected on the same grounds over claims 13 and 15 of U.S. Patent No. 6,290,696. The rejected claims as amended each recite cooling via phase change in a fluid along with other limitations. Applicant submits that this addition to each of the rejected claims makes the claims as a whole non-obvious in light of the cited claims, and therefore requests a withdrawal of the rejection.

Rejection Under 35 U.S.C. § 112

The Office action rejects claims 30 and 32 under 35 U.S.C. § 112, generally for lack of antecedent basis. Applicant believes that the amendments above address the concerns in the Office Action, and that the claims are in condition for immediate allowance.

Rejection Under 35 U.S.C. § 102 Over Saab

The Office Action rejects claims 28, 38, and 39 as anticipated by U.S. Patent No. 5,624,392 to Saab. The pending claims each recite cooling via a phase change in a liquid. Phase changes involve changes in energy that are many times greater than simple cooling of a fluid in a single phase. Thus, phase changes enable much greater power to be achieved from a device and

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may also allow the power to be targeted more readily. Thus, a phase change permits high-powered, focused cooling in proper applications.

In addition, such cooling may be achieved using a supply fluid that does not need to be as cold as it would if no phase change takes place. Rather, the heat absorbed from the tissue can be balanced by energy change in the fluid from the phase change, to get an equivalent or greater cooling effect than from use of liquid fluids throughout a process. As a result, it may be possible to create cooling with less supplied liquid, and thus be possible to make the catheter thinner. It may also be possible to construct the catheter with fewer thermal protections in the catheter shaft, because the supply fluid need not be as cold and, therefore, there can be less concern about freezing or otherwise damaging tissue around the catheter shaft.

The Saab patent discusses heat transfer catheters to produce a fluid circulation system. While the Saab reference indicates that useful fluids could include either liquids or gases, it neither mentions nor suggests the uses of phase changes in the fluid. *See* column 9, line 64 to column 10, line 10. The one embodiment of a full catheter shown in Saab is a closed-loop circulating system having a reservoir 43 from which the fluid is taken and into which it flows for recirculation. *See* Figure 1. This embodiment does not mention or even suggest the provision of any mechanisms, such as a compressor, by which to change gas-phase coolant to liquid-phase coolant. Also, the patent does not mention any open system by which gas could be removed. Indeed, when the patent does talk about particular temperature, it simply indicates that fluids other than water should be used for temperatures below 0°C or above 100°C. *See* column 10, lines 1-10. Thus, the patent simply contemplates a particular fluid in a particular phase, and actually teaches away from using a fluid in two different phases. Thus, there is nothing in Saab that either discloses or suggests use of a phase change in cooling.

Rejection Under 35 U.S.C. § 102 Over Saab

The Office Action rejects claims 31, 32, 36, 37, 40, and 41 as obvious in light of one or more of Saab, U.S. Patent No. 5,334,181 to Rubinsky et al., and U.S. Patent No. 5,078,713 to Varney. As noted above, Saab does not fairly suggest the use of fluids in two phases, and

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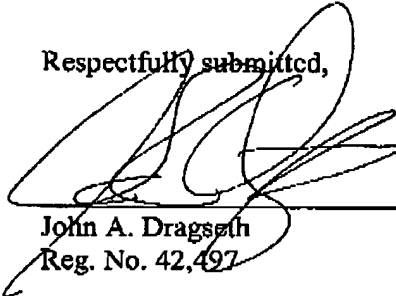
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actually teaches away from such a device or method. The Rubinsky and Varney references do not fill in for the failings of the Saab reference either, as they merely mention cooling with liquids and Joule-Thompson cooling. As such, Applicant respectfully suggests that each of the pending claims is in condition for allowance.

Please charge Deposit Account 06-1050 in the amount of \$120 for the Petition for Extension of Time fee. Please apply any other charges or credits to deposit account 06-1050.

Date: 5-18-05

Respectfully submitted,



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